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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/782,448	02/19/2004	Isam R. Makhoulf	CM05888G	5155
22917	7590	12/08/2005	EXAMINER	
MOTOROLA, INC. 1303 EAST ALGONQUIN ROAD IL01/3RD SCHAUMBURG, IL 60196			KHUU, HIEN DIEU THI	
			ART UNIT	PAPER NUMBER
			2863	

DATE MAILED: 12/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/782,448	Applicant(s) MAKHLOUF ET AL.	
	Examiner Cindy D. Khuu	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 24 and 25 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 20-23 is/are allowed.
- 6) ☒ Claim(s) 1-4 and 11-14 is/are rejected.
- 7) ☒ Claim(s) 5-10 and 15-19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of invention I, claims 1-23 in the reply filed on 10/28/05 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claims 24-25 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventions II.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4 and 11-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Maalej et al. (6,249,180).

With respect to claims 1 and 11, Maalej discloses a method for determining a frequency/timing error (Column 5: Lines 2-4)/(Column 4: Lines 38-39) over at least one frequency/timing search space for a received signal (Column 2: Lines 25-27), the method comprising the steps of: a) calculating a first noise estimation (Column 7: Lines 1-4) for a first frequency/timing offset (Column 6: Line 52) in a frequency/timing search space; b) calculating at least a second noise estimation for a second frequency/timing offset in said frequency/timing search space (Column 2: Lines 25-27); and c) determining a minimum noise estimation from said calculated noise estimations, wherein said frequency/timing error is the frequency/timing offset corresponding to said minimum noise estimation (Column 9: Lines 15-25, 34-41).

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With respect to claim 2, Maalej further discloses a method comprising the step of using said determined frequency/timing error to perform a frequency/timing adjustment (Column 6: Lines 32-40).

With respect to claim 3, Maalej further discloses a method wherein said received signal has a center frequency/timing and said frequency/timing error is used to adjust said center frequency/timing (Column 4: Lines 4-12).

With respect to claim 4, Maalej further discloses a method wherein said signal is received into a receiver having a channel estimation filter, and said channel estimation filter is frequency/timing adjusted using said frequency/timing error (Column 6: Lines 32-40).

Allowable Subject Matter

Claims 5-10 and 15-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 20-23 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art of record, taken alone or in combination, fails to disclose or render obvious:

With respect to claims 5 and 15, a method comprising: performing steps a) and b) for a first channel characterization over a first frequency/timing search space and determining a corresponding first preliminary minimum noise estimation; performing steps a) and b) for at least a second channel characterization over a second frequency/timing search space and determining a corresponding second preliminary minimum noise estimation; and selecting the minimum noise estimation from said preliminary minimum noise estimations.

With respect to claims 6 and 16, a method wherein each said channel characterization is based on at least one of a different Doppler hypothesis and a different delay spread hypothesis.

With respect to claims 7 and 17, a method wherein the minimum noise estimation is selected based on weighting each of the preliminary noise estimations and comparing the weighted preliminary noise estimations.

With respect to claims 8 and 18, a method comprising selecting a channel estimation filter design based on the channel characterization corresponding to said selected minimum noise estimation.

With respect to claims 9 and 19, a method wherein each of the frequency/timing offsets are uniformly spaced and are adjacent to each other in the frequency/timing search space.

With respect to claim 10, a method for determining a timing synchronization error for said received signal over at least one combined frequency and timing search space, wherein: said first noise estimation is calculated for a first frequency and timing offset pair in a combined frequency and timing search space; and said at least a second noise estimation is calculated for a second frequency and timing offset pair in said combined frequency and timing search space; and said timing error is the timing offset corresponding to said minimum noise estimation.

With respect to claim 20, a method for determining a frequency error and a timing synchronization error over at least one combined frequency and timing search space for a received signal, the method comprising the steps of: a) calculating a first noise estimation for a first frequency and timing offset pair in a combined frequency and timing search space; b) calculating at least a second noise estimation for a second frequency and timing offset pair in said combined frequency and timing search space; and c) determining a minimum noise estimation from said calculated noise estimations, wherein said frequency error is the frequency offset corresponding to said minimum noise estimation, and said timing error is the timing offset corresponding to said minimum noise estimation.

With respect to claim 21, a method for determining a frequency error over at least one frequency search space for a received signal, the method comprising the steps of: for a first channel characterization over a first frequency search space, calculating a first noise estimation for a first frequency offset in said first frequency search space; calculating at least a second noise estimation for a second frequency offset in said first frequency search space; and determining a corresponding first preliminary minimum noise estimation from said calculated noise estimations; for at least a second channel characterization over a second frequency search space, calculating a first noise estimation for a first frequency offset in said second frequency search space; calculating at least a second noise estimation for a second frequency offset in said second frequency search space; and determining a corresponding second preliminary minimum noise estimation from said calculated noise estimations; and selecting a minimum noise estimation from said preliminary minimum noise estimations, wherein said frequency error is the frequency offset corresponding to said minimum noise estimation.

With respect to claim 22, a method for determining a timing synchronization error over at least one timing search space for a received signal, the method comprising the steps of: for a first channel characterization over a first timing search space, calculating a first noise estimation for a first timing offset in said first timing search space; calculating at least a second noise estimation for a second timing offset in said first timing search space; and determining a corresponding first preliminary minimum noise estimation from said calculated noise estimations; for at least a second channel characterization over a second timing search space, calculating a first noise estimation for a first timing offset in said second timing search space; calculating at least a second noise estimation for a second timing offset in said second timing search space; and determining a corresponding second preliminary minimum noise estimation from said calculated noise estimations; and selecting a minimum noise estimation from said preliminary minimum noise estimations, wherein said timing error is the timing offset corresponding to said minimum noise estimation.

With respect to claim 23, a method for determining a frequency error and a timing synchronization error over at least one combined frequency and timing search space for a received signal, the method comprising the steps of: for a first channel characterization over a first combined frequency and timing search space, calculating a first noise estimation for a first frequency and timing offset pair in said first

combined frequency and timing search space; calculating at least a second noise estimation for a second frequency and timing offset pair in said first combined frequency and timing search space; and determining a corresponding first preliminary minimum noise estimation from said calculated noise estimations; for at least a second channel characterization over a second combined frequency and timing search space, calculating a first noise estimation for a first frequency and timing offset pair in said second combined frequency and timing search space; calculating at least a second noise estimation for a second frequency and timing offset pair in said second combined frequency and timing search space; and determining a corresponding second preliminary minimum noise estimation from said calculated noise estimations; and selecting a minimum noise estimation from said preliminary minimum noise estimation, wherein said frequency error is the frequency offset corresponding to said minimum noise estimation and said timing error is the timing offset corresponding to said minimum noise estimation.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed 10/28/2005 have been fully considered but they are not persuasive.

During patent examination, the pending claims must be given their broadest reasonable interpretation consistent with the specification. In re Hyatt, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000). Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969)

Regarding the 35 U.S.C. 102(b) rejections, Applicant argues that Maalej does not teach "a) calculating a first noise estimation for a first frequency offset in a frequency search space; b) calculating at least a second noise estimation for a second frequency offset in said frequency search space; and c) determining a minimum noise estimation from said calculated noise estimations, wherein said frequency

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error is the frequency offset corresponding to said minimum noise estimation" as is recited in claim 1 and "a) calculating a first noise estimation for a first timing offset in a timing search space; b) calculating at least a second noise estimation for a second timing offset in said timing search space; and c) determining a minimum noise estimation from said calculated noise estimations, wherein said timing error is the timing offset corresponding to said minimum noise estimation" as is recited in claim 11.

Examiner's position is that Maalej does teach "a) calculating a first noise estimation (additive noise estimation, Abstract, lines 2-3; Column 7: Lines 1-4) for a first frequency/timing offset (frequency/phase offset; Column 6: Line 52-53) in a frequency/timing search space; b) calculating at least a second noise estimation (phase noise estimation, Abstract, line 5) for a second frequency/timing offset (frequency/phase offset; Column 6: Line 52-53) in said frequency/timing search space; and c) determining a minimum noise estimation from said calculated noise estimations (Abstract, lines 8-11), wherein said frequency/timing error is the frequency/timing offset corresponding to said minimum noise estimation (Abstract, lines 8-11; Column 9: Lines 15-25, 34-41).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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The following prior art made of record and not relied upon is considered pertinent to applicant's disclosure: van de Beek et al. (US 6,628,926), Chennakeshu et al. (US 6,134,286), Boss et al. (US 6,965,242), and Moser (US 2005/0159928).

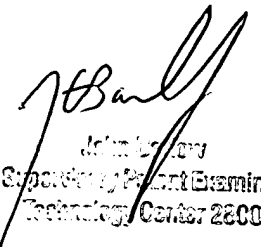
Fax/Telephone Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cindy D. Khuu whose telephone number is (571) 272-8585. The examiner can normally be reached on M-F, 8:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CHU 11/29/05


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